

Developing a Patient Intervention to Reduce Antibiotic Overuse

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Background. The emergence of drug resistance among common community-acquired bacterial infections has been clearly linked to the overuse of antibiotics. To address this problem, guidelines have been developed for the judicious use of antibiotics, particularly with regard to respiratory infection in adults and children. In addition, the CDC has promulgated guidelines for the general public, exhorting patients not to take an antibiotic for viral illnesses, not to pressure practitioners for antibiotic therapy, not to use antibiotics prescribed for another person, and not to use antibiotics left over from a previous illness. Despite some overall decline in antibiotic use, patients continue to engage in antibiotic overuse practices, resulting in increasing antimicrobial resistance. One reason for antibiotic overuse is “antibiotic expectation,” in which patients expect to be treated with an antibiotic for an acute infection, whether it is viral or bacterial.¹ This phenomenon points to an underlying system of beliefs held by patients toward antibiotic use that may be alterable by educational interventions.

The most effective interventions seem to be those that take into account the physician and the patient as co-actors in shared decision making. In one study², an intervention that included both physician- and patient-oriented education was found to be more effective in reducing antibiotic prescription rates than one that focused only on the patient, while others³ found that such an approach led to reduced antibiotic expectation by patients. The limited amount of evidence on the effectiveness of educational interventions on antibiotic overuse is encouraging, but by no means conclusive. Moreover, there is limited information on the relative effectiveness and cost of different methods of delivering educational interventions.

Study design. This pilot project focuses on the development and evaluation of a computerized educational patient intervention that uses interactive vignettes and user role-playing to reduce antibiotic overuse. The project is divided into three stages, underpinned by the Systems Model of Clinical Preventive Care⁴ as a conceptual framework. *Stage I* focuses on evidence-based ontology and formative

research techniques to identify the factors that are associated with the knowledge, beliefs, and attitudes held by patients and physicians with respect to antibiotic use. In *Stage II*, we will develop a computerized intervention that uses the knowledge we have gained from Stage I. This intervention will be aimed at changing knowledge, beliefs, and attitudes to the extent that patients realize a change in antibiotic expectation and ultimately, the level of antibiotic overuse. *Stage III* is dedicated to user-driven refinement of the intervention through a series of focus groups and development of a proposal for federal funding of a randomized controlled trial. We also will develop instruments to assess pre- and post-intervention knowledge, beliefs, attitudes, and intentions with respect to appropriate antibiotic use, as well as a follow-up survey to determine if subjects have had a persistent change in these dimensions.

Progress. We are currently in Stage I of this project, focusing on developing the ontology. The project is scheduled for completion in August, 2003.

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REFERENCES

1. Macnamara J, Harrington P, Walsh M, Walsh M, Burke M, Walsh N. Antibiotics for sore throat: impact of feedback to patients on the probability of bacterial infection. *Irish Medical Journal* 2000; 93(7):211-212.
2. Gonzales R, Steiner JF, Lum A, Barrett PH, Jr. Decreasing antibiotic use in ambulatory practice: impact of a multidimensional intervention on the treatment of uncomplicated acute bronchitis in adults. *JAMA* 1999; 281(16):1512-1519.
3. Finkelstein JA, Davis RL, Dowell SF, Metlay JP, Soumerai SB, Rifas-Shiman SL, et al. Reducing antibiotic use in children: a randomized trial in 12 practices. *Pediatrics* 2001; 108(1):1-7.
4. Walsh JME, McPhee SJ. A systems model of clinical preventive care: an analysis of factors influencing patient and physician. *Health Education Quarterly* 1992; 19(2):157-175.